CLAIMS

1. A printer with a multi-segment printhead, having a plurality of synchronized engine/controller chips, each chip configurable to be coupled with other engine/controller chips to drive the multi-segment printhead comprising:

a memory buffer for receiving compressed page data;

image decoders for expanding the compressed page data;

a half-toner/compositor to composite respective strips of the decoded image planes to produce composite strips; and

a printhead interface to output the composite strip to a printhead

the printhead interface including:

two output units, a first output unit providing a synchronization signal for multiple print engine/controller chips and a second output unit adapted to pulse a paper drive stepping motor, each output unit producing an external signal to enable line synchronization, a generator in each output unit producing a pulse in a number of cycles until instructed to stop, the pulse defining a start of a next line.

2. The printer of claim 1 wherein:

each printhead interface is adapted to receive an input signal which determines if the print engine controller is a master controller or a slave.

3. The printer of claim 1 wherein:

number of cycles is determined by a register, each cycle being long enough to allow a line to print and another line to load.

4. The printer of claim 1, wherein:

the half-toner/compositor has as an input, an expanded contone layer, an expanded bi-level spotl layer, an expanded dither-matrix-select bitmap and tag data;

the halftoner/compositor further comprising an output interface for transferring data to a printhead and enabling feedback from a specific segment.

5. The printer of claim 4 wherein:

the output interface contains a state machine that follows a printhead loading order and a dot count

for each color.

6. The printer of claim 4 wherein:

the output interface is directly connected to a line loader/format unit and the printhead.

7. The printer of claim 4 wherein:

the output interface loads data into the printhead from a first data source which is all binary ones causing a firing of all nozzles of the printhead during a subsequent print cycle; and

the output interface loads data into the printhead from a second data source being an input held in a transfer register of a line loader/format unit.

8. The printer of claim 4 wherein:

the output interface has a number of connections to the printhead, comprising a number of color connections clocked into a second number of segments per transfer to one or two segment groups.

9. The printer of claim 4 wherein:

the output interface maintains a count of the number of dots of each color fired from the printhead, the count being a value which is independently cleared under processor control.

10. The printer of claim 9 wherein:

a dot count is used by a processor on the chip to update a QA chip in order to predict when an ink cartridge runs out of ink.

11. The printer of claim 10 wherein:

the processor communicated with the output interface via a register set that allows the processor to parameterize a print as well as receive feedback about a print.

12. The printer of claim 10 wherein;

an updated drop count is written to the QA chip after a page is completed.

13. The printer of claim 1 wherein:

the pipeline fashion expansion further comprises the expansion, in parallel with the layers, of a Group 4 Fax-compressed bi-level dither matrix selection map.

14. The printer of claim 13 wherein:

the pipeline fashion expansion further comprises a second stage dithering of the contone CMYK layer using a dither matrix selected by the dither matrix select map.

15. The printer of claim 1, wherein:

the half-toner/compositor further comprises a number of scale units, each scale unit receiving data from a buffer layer and at least one scale unit receiving two control bits, the control bits being an advance dot bit and an advance line bit.

16. The printer of claim 15, wherein:

the advance dot bit allows for the generation of multiple instances of identical dot data and the advance line bit provides for truncation of data according to a printer margin.

17. The printer of claim 15, wherein:

the buffer layers comprise contone layers, a bi-level spot1 layer and a dither select matrix layer, each of which may be scaled independently.